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Serial No. 09/578,095

RD-27,376

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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MAY 17 2004

Inventor: Aragonés et al.

Group Art Unit: 2123

Serial No.: 09/578,095

Examiner: Thangavelu

Filed: May 25, 2000

Title: SYSTEM AND METHOD FOR
PREDICTING TIMING OF
FUTURE SERVICE OF A
PRODUCT

Response to Paper No.: 6

OFFICIAL

PETITION TO WITHDRAW THE FINALITY OF AN OFFICE ACTION UNDER 37 C.F.R. §1.181Mail Stop Non-Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

S I R:

In accordance with 37 C.F.R. § 1.181, Applicant respectfully requests that the U.S. Patent and Trademark Office (PTO) withdraw the finality of the Office Action dated March 04, 2004 for the above-identified patent application as premature.

In an Office Action (Exhibit A) dated September 25, 2003, the Examiner rejected claims 1-3, 5-8, 22, 23, 25-28, 42, 43, 45-48, 62, 63 and 65-68 under 35 U.S.C. §103(a) as being unpatentable over Kaminsky et al. in view of Cribbes and further in view of Endrenyi et al. In response to this rejection, Applicant submitted an Amendment (Exhibit B) on September 25, 2003 to overcome the §103(a) rejection. In particular, Applicant amended independent claims 1, 22, 42 and 62 to overcome the 35 U.S.C. §103(a) rejection by incorporating limitations from depending claims 7-0, 17-19, 27-28, 37-39, 47-48, 57-59, 67-68 and 77-79 respectively and canceled the depending claims 7-0, 17-19, 27-28, 37-39, 47-48, 57-59, 67-68 and 77-79. Also, Applicant added extra limitations to claims 1, 22, 42 and 62 to further distinguish over the prior art. In addition, Applicant amended claims 9, 20, 29, 40, 49, 60, 69 and 80 to maintain proper claim dependency. Also, Applicant amended claims 6 and 32 to correct minor inconsistencies.

The result of this Amendment was that each of the independent claims (1, 22, 42, and 62) were amended to recite a statistical analyzer that analyzes the plurality of service information to determine a plurality of compartment failure information comprising compartment failure variables

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and compartment time-to-failure coefficients, wherein the analyzing uses the plurality of compartment failure information to determine which compartment failure variables influence the timing of future service events and estimate time-to-failure distributions for the plurality of compartments, a performance deterioration rate analyzer that analyzes performance deterioration rate of the product from the plurality of service information and performance information, wherein the performance deterioration rate analyzer comprises a statistical analysis script that relates a subset of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for the subset of compartments of the product, wherein the performance deterioration rate analyzer further comprises a transformer that transforms each estimated deterioration rate curve for a compartment to a performance life distribution; and a simulator for simulating a distribution of future service events of the product according to the time-to-failure distributions and performance life distributions

In response to the Amendment, the Examiner mailed a Final Office Action (Exhibit C) on March 04, 2004, which rejected claims 1-3, 5-6, 22, 23, 25-26, 42, 43, 45-46, 62, 63 and 65-66 under 35 U.S.C. §103(a) as being unpatentable over Kaminskiy et al. in view of Cribbes et al. and further in view of Endrenyi et al., Butler, Wang and Hussein. In the Final Office Action, the Examiner acknowledged that the §103(a) rejection is new, but submitted that Applicant's amendment necessitated the new ground of rejection.

Applicant submits that the Final Office Action is premature and requests that the Technology Center Director withdraw the finality. According to the Manual Of Patent Examining Procedure (MPEP) 706.07(a), a "second . . . action[] on the merits shall be made final, except where the [E]xaminer introduces a new ground of rejection that is neither necessitated by [A]pplicant's amendment of the claims nor based on information submitted in an information disclosure statement" In the present patent application, the limitation (i.e., a statistical analyzer that analyzes the plurality of service information to determine a plurality of compartment failure information..., a performance deterioration rate analyzer... wherein the performance deterioration rate analyzer comprises a statistical analysis script..., and a simulator for simulating a distribution of future service events... according to the time-to-failure distributions and performance life distributions) in the Amendment that the Examiner believes necessitated the new ground of rejection was recited in the originally filed dependent claims (i.e., claims 7-8, 17-19, 27-28, 37-39, 47-49, 57-59, 67-68 and 77-79). In the Office Action the Examiner rejected each of these depending claims under §103(a) as being unpatentable over Kaminskiy et al. In view of Cribbes and further in view of Endrenyi et al. In the Amendment, Applicant inserted the limitations of the statistical analyzer, the performance deterioration rate analyzer and the simulator from the

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depending claims into the independent claims in order to distinguish over the §103(a) rejection under Kaminskiy et al. in view of Cribbes and further in view of Erdrenyi et al. The Examiner should have recognized that Kaminskiy et al. in view of Cribbes and further in view of Erdrenyi et al. does not anticipate the limitations of the statistical analyzer, the performance deterioration rate analyzer and the simulator and that it would have been conceivable that Applicant might incorporate subject matter from a dependent claim into an independent claim in order to distinguish over this patent. Since the changes made in the Amendment contained limitations that were already recited in the claimed invention and were not based on information submitted in an information disclosure statement, Applicant submits that the Amendment did not necessitate a new ground of rejection. Accordingly, Applicant submits that the Final Office Action is premature and requests that the Technology Center Director withdraw the finality.

According to 37 C.F.R. § 1.181, there is no fee associated with submitting this petition to withdraw the finality of an office action, however, if Applicant is mistaken, then Applicant authorizes the PTO to charge any fees to Deposit Account No. 07-0868.

Respectfully submitted,



PATRICK K. PATNODE
Attorney for Applicant
Registration No. 40,121

Schenectady, New York
Dated: April 30, 2004

30 PAGES

Ino. 12-25-03



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/378,095	05/25/2003	Juanita Kenneth Aragona	RD-27,376	6313

6147 7390 07/25/2003
GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH CENTER
PATENT DOCKET RM. 4A39
PO BOX 8, BLDG. K-1 ROSS
NISKAYUNA, NY 12309

EXAMINER

THANGAVELU, KANDASAMY

ART UNIT

PAYER NUMBER

3123

DATE MAILED: 09/25/2003

3

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

EXHIBIT A

Office Action Summary

Application No.	Applicant(s)	
09/578,095	ARAGONES ET AL.	
Examiner	Art Unit	
Kandasamy Thangavelu	2123	

The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.130(e). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 463 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-81 is/are pending in the application.
- 4a) Of the above claim(s) is/are withdrawn from consideration.
- 5) ☐ Claim(s) is/are allowed.
- 6) ☒ Claim(s) 1-81 is/are rejected.
- 7) ☐ Claim(s) is/are objected to.
- 8) ☐ Claim(s) are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 May 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.65(a).
- 11) ☐ The proposed drawing correction filed on is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(b)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) .
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other.

US Patent and Trademark Office

Office Action Summary

Part of Paper No. 3

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DETAILED ACTION***Introduction***

1. Claims 1-81 of the application have been examined.

Information Disclosure Statement

2. Acknowledgment is made of the information disclosure statements filed on May 25, 2000 together with copies of the papers. The papers have been considered in reviewing the claims.

Drawings

3. The draft person has objected to the drawings; see a copy of Form PTO-948 for an explanation.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

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Art Unit: 2123

DETAILED ACTION

Introduction

1. Claims 1-81 of the application have been examined.

Information Disclosure Statement

2. Acknowledgment is made of the information disclosure statements filed on May 25, 2000 together with copies of the papers. The papers have been considered in reviewing the claims.

Drawings

3. The draft person has objected to the drawings; see a copy of Form PTO-948 for an explanation.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

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5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-3, 5-8, 22, 23, 25-28, 42, 43, 45-48, 62, 63 and 65-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997), and further in view of Endrenyi et al. (EN) (IEEE, 1997).

6.1 KA teaches a Monte Carlo approach to Warranty Repair predictions. Specifically, as per Claim 1, KA teaches a system for predicting the timing of a future service event of a product formed from a plurality of compartments (Pg 1, Abstract; Pg 2, CL2, Para 3 & 4); comprising:
a simulator for simulating a distribution of future service events of the product according to the plurality of compartment failure information and the performance deterioration rate analysis (Pg 1, Abstract; Pg 1, CL1, Para 3; Pg 2, CL2, Para 3 & 4; Pg 3, CL2, Para 2; Fig. 5).

KA does not expressly teach a database that contains a plurality of service information and a plurality of performance information for the product. CR teaches a database that contains a plurality of service information (Pg 9, CL1, Para 2 & 3) and a plurality of performance

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information for the product (Pg 9, CL1, Para 4), as the performance information indicates specific deterioration and the service information and the performance information will identify the likely maintenance actions required at the next shop visit (Pg 9, CL1, Para 3) so the maintenance shop can develop proper maintenance process (Pg 9, CL1, Para 4). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of CR that included a database that contained a plurality of service information and a plurality of performance information for the product, as the performance information would indicate specific deterioration and the service information and the performance information would identify the likely maintenance actions required at the next shop visit so the maintenance shop could develop proper maintenance process.

KA does not expressly teach a statistical analyzer that analyzes the plurality of service information to determine a plurality of compartment failure information. EN teaches a statistical analyzer that analyzes the plurality of service information to determine a plurality of compartment failure information (Pg 576, CL2, Para 2 & 5; Pg 578, CL1, Para 4 & 5; Fig. 2; Pg 579, CL2, Para 5; Fig. 6), as the compartment failure information can be used to determine means, variances and the probability distributions of times to failures of the compartments (Pg 578, CL1, Para 4 & 5). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of EN that included a statistical analyzer that analyzes the plurality of service information to determine a plurality of compartment failure information, as the compartment failure information could be used to determine means, variances and the probability distributions of times to failures of the compartments.

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KA does not expressly teach a performance deterioration rate analyzer that analyzes performance deterioration rate of the product from the plurality of service information and performance information. CR teaches a performance deterioration rate analyzer that analyzes performance deterioration rate of the product from the plurality of service information and performance information (Pg 9, CL1, Para 3 & 4), as the performance deterioration rate information identifies the likely maintenance actions required at the next shop visit (Pg 9, CL1, Para 3), so the maintenance shop could develop proper maintenance process (Page 9, CL1, Para 4). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of CR that included a performance deterioration rate analyzer that analyzes performance deterioration rate of the product from the plurality of service information and performance information, as the performance deterioration rate information would identify the likely maintenance actions required at the next shop visit so the maintenance shop could develop proper maintenance process.

Dependent claims

Per Claim 2: KA, CR and EN teach the system of Claim 1. KA does not expressly teach that the database comprises a service database and a performance historical database. CR teaches that the database comprises a service database and a performance historical database (Pg 9, CL1, Para 2 & 3), as the performance information indicates specific deterioration and the service information and the performance information will identify the likely maintenance actions required at the next shop visit (Pg 9, CL1, Para 3) so the maintenance shop can develop proper maintenance process (Pg 9, CL1, Para 4). It would have been obvious to one of ordinary skill in

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the art at the time of Applicants' invention to modify the system of KA with the system of CR that included the database comprising a service database and a performance historical database, as the performance information would indicate specific deterioration and the service information and the performance information would identify the likely maintenance actions required at the next shop visit so the maintenance shop could develop proper maintenance process.

Per Claim 3: KA, CR and EN teach the system of Claim 1. KA does not expressly teach that the plurality of service information comprises compartment definitions, repair history and service factors. CR teaches that the plurality of service information comprises compartment definitions, repair history and service factors (Pg 9, CL1, Para 2 & 3), as the service information will identify the likely maintenance actions required at the next shop visit, so suitable preparations can be made before the product arrives for repair and maintenance (Pg 9, CL1, Para 3). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of CR that included the plurality of service information comprising compartment definitions, repair history and service factors, as the service information would identify the likely maintenance actions required at the next shop visit, so suitable preparations could be made before the product arrives for repair and maintenance.

Per Claim 5: KA, CR and EN teach the system of Claim 1. KA does not expressly teach system further comprising a preprocessor for processing the plurality of service information into a predetermined format. EN teaches system further comprising a preprocessor for processing the

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plurality of service information into a predetermined format (Fig. 3), as the service information can be used to obtain the compartment failure information (Fig. 2) and compartment failure information can be used to determine means, variances and the probability distributions of times to failures of the compartments (Pg 578, CII, Para 4 & 5). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of EN that included system further comprising a preprocessor for processing the plurality of service information into a predetermined format, as the service information could be used to obtain the compartment failure information and the compartment failure information could be used to determine means, variances and the probability distributions of times to failures of the compartments.

Per Claim 6: KA, CR and EN teach the system of Claim 1. KA does not expressly teach that the preprocessor generates a plurality of data files according to the plurality of service information. EN teaches that the preprocessor generates a plurality of data files according to the plurality of service information (Fig. 2), as the information can be used to predict the mean and distribution of the remaining life to failure for any stage of aging (Pg 576, Abstract). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of EN that included the preprocessor generating a plurality of data files according to the plurality of service information, as the information could be used to predict the mean and distribution of the remaining life to failure for any stage of aging.

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Per Claim 7: KA, CR and EN teach the system of Claim 1. KA does not expressly teach that the plurality of compartment failure information comprises compartment failure variables and compartment time-to-failure coefficients. EN teaches that the plurality of compartment failure information comprises compartment failure variables and compartment time-to-failure coefficients (Pg 578, CL2, Para 3 to Pg 579, CL1, Para 3; Fig. 6), as the information can be used to obtain the failure information for the entire system and the cost incurred due to component failures (Pg 581, CL2, Para 2); and a mathematical model can be constructed linking failures and maintenance modes and used to compute costs of alternative maintenance schedules (Pg 581, CL2, Para 3). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of EN that included that the plurality of compartment failure information comprising compartment failure variables and compartment time-to-failure coefficients, as the information could be used to obtain the failure information for the entire system and the cost incurred due to component failures and a mathematical model could be constructed linking failures and maintenance modes and used to compute costs of alternative maintenance schedules.

Per Claim 8: KA, CR and EN teach the system of Claim 7. KA does not expressly teach that the statistical analyzer uses the plurality of compartment failure information to determine which compartment failure variables influence the timing of future service events and estimate time-to-failure distributions for the plurality of compartments. EN teaches that the statistical analyzer uses the plurality of compartment failure information to determine which compartment failure variables influence the timing of future service events and estimate time-to-failure

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distributions for the plurality of compartments (Fig3; Pg 578, CL2, Para 3 to Pg 579, CL1, Para 3; Fig. 2; Fig. 6), as the information can be used to obtain the failure information for the entire system and the cost incurred due to component failures (Pg 581, CL2, Para 2); and a mathematical model can be constructed linking failures and maintenance modes and used to compute costs of alternative maintenance schedules (Pg 581, CL2, Para 3). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of EN that included the statistical analyzer using the plurality of compartment failure information to determine which compartment failure variables influence the timing of future service events and estimate time-to-failure distributions for the plurality of compartments, as the information could be used to obtain the failure information for the entire system and the cost incurred due to component failures and a mathematical model could be constructed linking failures and maintenance modes and used to compute costs of alternative maintenance schedules.

6.2 As per Claims 22, 23, 25-28, 42, 43, 45-48, 62, 63 and 65-68, these are rejected based on the same reasoning as Claims 1, 3, and 5-8, supra. Claims 22, 23, 25-28, 42, 43, 45-48, 62, 63 and 65-68 are system, method and computer readable medium claims reciting the same limitations as Claims 1, 3, and 5-8, as taught throughout by KA, CR and EN.

7. Claims 4, 21, 24, 41, 44, 61, 64 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbs (CR) ("Changes in Engine

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maintenance management", Aerospace Engineering, December 1997), and further in view of Endreyi et al. (EN) (IEEE, 1997) and Aerospace Technology (AT) ("Forecasting engine removals and shop visits", Aircraft Technology Engineering & maintenance, 1996-1997).

7.1 As per Claim 4, KA, CR and EN teach the system of Claim 1. KA, CR and EN do not expressly teach that the plurality of performance information comprises performance characteristic values, initial data levels after servicing, current data levels. AT teaches that the plurality of performance information comprises performance characteristic values, initial data levels after servicing, current data levels (Pg 3, CL1, Para 1 & 3; Pg 4, CL1, Para 2; Pg. 4, CL2, Para 1), as the information can be used to forecast product removal rates to construct a plan for incoming product volumes; and the forecast can be used for maintenance cost planning yielding requirements for material and manpower for maintenance (Pg 3, CL1, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR and EN with the system of AT that included the plurality of performance information comprising performance characteristic values, initial data levels after servicing, current data levels, as the information could be used to forecast product removal rates to construct a plan for incoming product volumes; and the forecast could be used for maintenance cost planning yielding requirements for material and manpower for maintenance.

KA, EN and AT do not expressly teach that the plurality of performance information comprises dates at which the product is serviced, and variables that affect the servicing of a subset of the plurality of compartments. CR teaches that the plurality of performance information comprises dates at which the product is serviced, and variables that affect the

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servicing of a subset of the plurality of compartments (Pg 9, CL1, Para 3 to 6), as the performance information will identify the likely maintenance actions required at the next shop visit (Pg 9, CL1, Para 3) so the maintenance shop can develop proper maintenance process (Pg 9, CL1, Para 4). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, EN and AT with the system of CR that included the plurality of performance information comprising dates at which the product would be serviced, and variables that affect the servicing of a subset of the plurality of compartments, as the performance information would identify the likely maintenance actions required at the next shop visit so the maintenance shop could develop proper maintenance process.

Per Claim 21: KA, CR and EN teach the system of Claim 1. KA does not expressly teach that the simulator forecasts a service plan for the future service events that comprises the time for scheduling the service events. AT teaches that the simulator forecasts a service plan for the future service events that comprises the time for scheduling the service events (Pg 3, CL1, Para 2; Pg 4, CL1, Para 2; Pg 4, CL2, Para 1), as the forecast can be used for maintenance cost planning yielding requirements for material and manpower for maintenance (Pg 3, CL1, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of AT that included that the simulator forecast a service plan for the future service events that comprised the time for scheduling the service events, as the forecast could be used for maintenance cost planning yielding requirements for material and manpower for maintenance.

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7.2 As per Claims 24, 41, 44, 61, 64 and 81, these are rejected based on the same reasoning as Claims 4 and 21, supra. Claims 24, 41, 44, 61, 64 and 81 are system, method and computer readable medium claims reciting the same limitations as Claims 4 and 21, as taught throughout by KA, CR, EN and AT.

8. Claims 9, 29, 49 and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997), and further in view of Endrenyi et al. (EN) (IEEE, 1997) and Woodman et al. (WO) (U.S. Patent 6,195,624).

8.1 As per Claim 9, KA, CR and EN teach the system of Claim 8. KA, CR and EN do not expressly teach that the statistical analyzer uses the estimated time-to-failure distributions to determine a Weibull distribution for a subset of the plurality of compartments defined for the product. WO teaches that the statistical analyzer uses the estimated time-to-failure distributions to determine a Weibull distribution for a subset of the plurality of compartments defined for the product (CL6, L30-56), as the Weibull model uses shape and scale parameters which have physical significance; the scale parameter indicates the time at which 63% of the population have failed; and the shape parameter indicates the rate at which the failures increase (CL6, L48-56). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR and EN with the system of WO that included the statistical analyzer using the estimated time-to-failure distributions to determine a Weibull distribution for

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a subset of the plurality of compartments defined for the product, as the Weibull model uses shape and scale parameters which have physical significance; the scale parameter indicates the time at which 63% of the population have failed; and the shape parameter indicates the rate at which the failures increase.

8.2 As per Claims 29, 49 and 69, these are rejected based on the same reasoning as Claim 9, supra. Claims 29, 49 and 69 are system, method and computer readable medium claims reciting the same limitations as Claim 9, as taught throughout by KA, CR, EN and WO.

9. Claims 10, 30, 50 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997), and further in view of Eudrenyi et al. (EN) (IEEE, 1997) and Subramanyam (SU) (U.S. Patent 5,701,471).

9.1 As per Claim 10, KA, CR and EN teach the system of Claim 1. KA, CR and EN do not expressly teach that the statistical analyzer comprises a service analysis script that executes a plurality of statistical procedures. SU teaches that the statistical analyzer comprises a service analysis script that executes a plurality of statistical procedures (Abstract; Fig. 1, BLK 116 and 120; Fig. 2; CL2, L25-43), as the scripts specify the operations to be performed and the performance statistics to be collected (CL2, L25-29). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR and

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EN with the system of SU that included the statistical analyzer comprising a service analysis script that executed a plurality of statistical procedures, as the scripts would specify the operations to be performed and the performance statistics to be collected.

9.2 As per Claims 30, 50 and 70, these are rejected based on the same reasoning as Claim 10, supra. Claims 30, 50 and 70 are system, method and computer readable medium claims reciting the same limitations as Claim 10, as taught throughout by KA, CR, EN and SU.

10. Claims 11, 31, 51 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997), and further in view of Endrenyi et al. (EN) (IEEE, 1997), Subramanyam (SU) (U.S. Patent 5,701,471) and Djaja et al. (DJ) (U.S. Patent 6,405,160).

10.1 As per Claim 11, KA, CR, EN and SU teach the system of Claim 10. KA, CR, EN and SU do not expressly teach that the plurality of statistical procedures comprise a multivariate regression and/or a correlation analysis. DJ teaches that the plurality of statistical procedures comprise a multivariate regression and/or a correlation analysis (CL5, L52-59), as in the multivariate regression analysis, the changes in independent variables that correlate highly with dependent variables are allowed to remain in the modeling equation (CL2, L25-29). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to

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modify the system of KA, CR, EN and SU with the system of DJ that included the plurality of statistical procedures comprising a multivariate regression and/or a correlation analysis, as in the multivariate regression analysis, the changes in independent variables that correlate highly with dependent variables would be allowed to remain in the modeling equation.

10.2 As per Claims 31, 51 and 71, these are rejected based on the same reasoning as Claim 11, supra. Claims 31, 51 and 71 are system, method and computer readable medium claims reciting the same limitations as Claim 11, as taught throughout by KA, CR, EN, SU and DJ.

11. Claims 12, 32, 52 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAF International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997), and further in view of Endreyi et al. (EN) (IEEE, 1997), Subramanyam (SU) (U.S. Patent 5,701,471) and Cave et al. (CA) (U.S. Patent 5,740,233).

11.1 As per Claim 12, KA, CR, EN and SU teach the system of Claim 10. KA, CR, EN and SU do not expressly teach that the service analysis script generates a plurality of statistical diagnostic information. CA teaches that the service analysis script generates a plurality of statistical diagnostic information (CL3, L27-30; CL3, L55-64), as changes in the statistical diagnostic information could be used to identify faults and alert the personnel, when they fall outside set thresholds (CL4, L9-15). It would have been obvious to one of ordinary skill in the

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art at the time of Applicants' invention to modify the system of KA, CR, EN and SU with the system of CA that included the service analysis script generating a plurality of statistical diagnostic information, as changes in the statistical diagnostic information could be used to identify faults and alert the personnel, when they fell outside set thresholds.

11.2 As per Claims 32, 52 and 72, these are rejected based on the same reasoning as Claim 12, supra. Claims 32, 52 and 72 are system, method and computer readable medium claims reciting the same limitations as Claim 12, as taught throughout by KA, CR, EN, SU and CA.

12. Claims 13, 33, 53 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997), and further in view of Endrenyi et al. (EN) (IEEE, 1997), Subramanyam (SU) (U.S. Patent 5,701,471), Cave et al. (CA) (U.S. Patent 5,740,233), Stoughton et al. (ST) (U.S. Patent 6,132,969) and Baleanu (BA) (U.S. Patent 5,748,508).

12.1 As per Claim 13, KA, CR, EN, SU and CA teach the system of Claim 12. KA, CR, EN, SU and CA do not expressly teach that the plurality of statistical diagnostic information comprises goodness-of-fit metrics and collinearity diagnostics. ST teaches that the plurality of statistical diagnostic information comprises goodness-of-fit metrics (Abstract; CL3, L26-52; CL3, L55-64), as goodness-of-fit measures how well a given model represents the underlying data (CL3, L26-28). It would have been obvious to one of ordinary skill in the art at the time of

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Applicants' invention to modify the system of KA, CR, EN, SU and CA with the system of ST that included the plurality of statistical diagnostic information comprising goodness-of-fit metrics, as goodness-of-fit would measure how well a given model represents the underlying data.

KA, CR, EN, SU, CA and ST do not expressly teach that the plurality of statistical diagnostic information comprises collinearity diagnostics. BA teaches that the plurality of statistical diagnostic information comprises collinearity diagnostics (Abstract), as collinearity measures is used to identify collinearity free regression models to best model and control a process (Abstract). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN, SU, CA and ST with the system of BA that included the plurality of statistical diagnostic information comprising collinearity diagnostics, as collinearity measures would be used to identify collinearity free regression models to best model and control a process.

12.2 As per Claims 33, 53 and 73, these are rejected based on the same reasoning as Claim 13, supra. Claims 33, 53 and 73 are system, method and computer readable medium claims reciting the same limitations as Claim 13, as taught throughout by KA, CR, EN, SU, CA, ST and BA.

13. Claims 14, 34, 54 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997), and further in view of Endrenyi et al. (EN) (IEEE,

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1997), **Subramanyam (SU)** (U.S. Patent 5,701,471) and **Mecster et al. (ME)** (U.S. Patent 5,686,359).

13.1 As per Claim 14, **KA, CR, EN** and **SU** teach the system of Claim 12. **KA, CR, EN** and **SU** do not expressly teach that the service analysis script generates a plurality of residual plots. **ME** teaches that the service analysis script generates a plurality of residual plots (CL4, L52-56), as the residual plots indicate the lack of inadequacy of the models (CL3, L26-28). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of **KA, CR, EN** and **SU** with the system of **ME** that included the service analysis script generating a plurality of residual plots, as the residual plots would indicate the lack of inadequacy of the models.

13.2 As per Claims 34, 54 and 74, these are rejected based on the same reasoning as Claim 14, supra. Claims 34, 54 and 74 are system, method and computer readable medium claims reciting the same limitations as Claim 14, as taught throughout by **KA, CR, EN, SU** and **ME**.

14. Claims 15, 16, 35, 36, 55, 56, 75 and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kaminskiy et al. (KA)** ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of **Cribbes (CR)** ("Changes in Engine maintenance management", Aerospace Engineering, December 1997), and further in view of **Endrenyi et al. (EN)** (IEEE, 1997), and **Kozam et al. (KO)** (U.S. Patent application 2002/0035570).

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14.1 As per Claim 15, KA, CR and EN teach the system of Claim 1. KA, CR and EN do not expressly teach that the statistical analyzer comprises a validation script. KO teaches that the statistical analyzer comprises a validation script (Para 0008, Para 0029), as the validation script provides information necessary to check the data received as service and performance information against the data already in the database (Para 0033). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR and EN with the system of KO that included the statistical analyzer comprising a validation script, as the validation script would provide information necessary to check the data received as service and performance information against the data already in the database.

Per Claim 16: KA, CR and EN do not expressly teach that the validation script is applied to a plurality of case studies set up for the product. KO teaches that the validation script is applied to a plurality of case studies set up for the product (Para 0008, Para 0029), as the validation script provides information necessary to check the data received as service and performance information against the data already in the database (Para 0033). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR and EN with the system of KO that included the validation script being applied to a plurality of case studies set up for the product, as the validation script would provide information necessary to check the data received as service and performance information against the data already in the database.

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14.2 As per Claims 35, 36, 55, 56, 75 and 76, these are rejected based on the same reasoning as Claims 15 and 16, supra. Claims 35, 36, 55, 56, 75 and 76 are system, method and computer readable medium claims reciting the same limitations as Claims 15 and 16, as taught throughout by KA, CR, EN and KO.

15. Claims 17, 37, 57 and 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997), and further in view of Endrenyi et al. (EN) (IEEE, 1997), and Butler (BU) ("An expert system based Framework for an incipient failure detection and Preventive maintenance system, IEEE 1996).

15.1 As per Claim 17, KA, CR and EN teach the system of Claim 1. KA, CR and EN do not expressly teach that the performance deterioration rate analyzer comprises a statistical analysis script that relates a subset of compartments of the product according to time. BU teaches that the performance deterioration rate analyzer comprises a statistical analysis script that relates a subset of compartments of the product according to time (Pg 321, CL1, Para 5; Pg 321, CL2, Para 2; Pg 322, CL1, Para 3; Pg 321, CL2, Para 4 & 5), as the determination of the related times to failures of the compartments facilitates optimizing preventive maintenance program through system wide approach to predict equipment failures (Pg. 321, CL2, Para 2 & 3). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR and EN with the system of BU that included the performance deterioration rate analyzer

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comprising a statistical analysis script that relates a subset of compartments of the product according to time, as the determination of the related times to failures of the compartments would facilitate optimizing preventive maintenance program through system wide approach to predict equipment failures.

15.2 As per Claims 37, 57 and 77, these are rejected based on the same reasoning as Claim 17, supra. Claims 37, 57 and 77 are system, method and computer readable medium claims reciting the same limitations as Claim 17, as taught throughout by KA, CR, EN and BU.

16. Claims 18, 19, 38, 39, 58, 59, 78 and 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997), and further in view of Endrenyi et al. (EN) (IEEE, 1997), Butler (BU) ("An expert system based Framework for an incipient failure detection and Preventive maintenance system, IEEE 1996), and Wang (WA) (U.S. Patent 6,230,095).

16.1 As per Claim 18, KA, CR, EN and BU teach the system of Claim 17. KA, CR, EN and BU do not expressly teach that the statistical analysis script generates an estimated deterioration rate curve for the subset of compartments of the product. WA teaches that the statistical analysis script generates an estimated deterioration rate curve for the subset of compartments of the product (Abstract; CL2, L22-37), as the deterioration curve can be used to generate a warning

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signal to the system operator and as a tool for product service recommendations (CL1, Lines 15-18). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN and BU with the system of WA that included the statistical analysis script generating an estimated deterioration rate curve for the subset of compartments of the product, as the deterioration curve could be used to generate a warning signal to the system operator and as a tool for product service recommendations.

Per Claim 19: KA, CR, EN and WA do not expressly teach that the performance deterioration rate analyzer further comprises a transformer that transforms each estimated deterioration rate curve for a compartment to a performance life distribution. BU teaches that the performance deterioration rate analyzer further comprises a transformer that transforms each estimated deterioration rate curve for a compartment to a performance life distribution (Pg 321, CL 1, Para 5 to CL2, Para1), as the performance life distribution can be used to predict how long the system can operate safely and to optimize preventive maintenance programs (Pg 321, CL2, Para 1 & 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN and WA with the system of BU that included the performance deterioration rate analyzer further comprising a transformer that transformed each estimated deterioration rate curve for a compartment to a performance life distribution, as the performance life distribution could be used to predict how long the system could operate safely and to optimize preventive maintenance programs.

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16.2 As per Claims 38, 39, 58, 59, 78 and 79, these are rejected based on the same reasoning as Claims 18 and 19, supra. Claims 38, 39, 58, 59, 78 and 79 are system, method and computer readable medium claims reciting the same limitations as Claims 18 and 19, as taught throughout by KA, CR, EN, BU and WA.

17. Claims 20, 40, 60 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kaniuskiy et al. (KA)** ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of **Cribbes (CR)** ("Changes in Engine maintenance management", Aerospace Engineering, December 1997), and further in view of **Endrenyi et al. (EN)** (IEEE, 1997), **Butler (BU)** ("An expert system based Framework for an incipient failure detection and Preventive maintenance system, IEEE 1996), **Wang (WA)** (U.S. Patent 6,230,095) and **Moosa et al. (MO)** (U.S. Patent 5,822,218).

17.1 As per Claim 20, **KA, CR, EN, BU and WA** teach the system of Claim 19. **KA, CR, EN, BU and WA** do not expressly teach that the simulator uses the performance life distributions to determine a Weibull distribution for a subset of the plurality of compartments defined for the product. **MO** teaches that the simulator uses the performance life distributions to determine a Weibull distribution for a subset of the plurality of compartments defined for the product (CL4, L56-67), as the Weibull distribution is sensitive to the distribution shape parameter at the extremities of the distribution and extrapolations can be made based on the properties of the distribution (CL4, L56-67; CL17, L36-41). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of **KA, CR, EN, BU and WA**

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with the system of MO that included the simulator using the performance life distributions to determine a Weibull distribution for a subset of the plurality of compartments defined for the product, as the Weibull distribution is sensitive to the distribution shape parameter at the extremities of the distribution and extrapolations could be made based on the properties of the distribution.

17.2 As per Claims 40, 60 and 80, these are rejected based on the same reasoning as Claim 20, supra. Claims 40, 60 and 80 are system, method and computer readable medium claims reciting the same limitations as Claim 20, as taught throughout by KA, CR, EN, BU, WA and MO.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to the Applicants' disclosure.

The following patents and papers are cited to further show the state of the art at the time of Applicants' invention with respect to Service prediction using performance and service information and simulation models.

1. Moore, "Apparatus and method for monitoring and maintaining mechanized equipment", U.S. Patent 6,370,454, April 2002.
2. March, "Method and apparatus for monitoring hydroelectric facility maintenance ...", U.S. Patent 6,490,506, December 2002.

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3. Hadeen et al., "Locomotive diagnostic system", U.S. Patent 6,377,876, April 2002.
4. Richer, "Engine monitoring display for maintenance management", U.S. Patent 6,408,258, June 2002.
5. Okogbaa et al., "Time series intervention analysis for Preventive/ Predictive maintenance management of multiunit systems", IEEE 1998.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 703-305-0043. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

If attempts to reach examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska, can be reached on (703) 305-9704. The fax phone number for the organization where this application or proceeding is assigned is 703-746-7329.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9600.

K. Thangavelu
Art Unit 2123
September 19, 2003


SAMUEL BRODA, ESQ.
PRIMARY EXAMINER

Form PTO-948 (Rev. 06/94)
Application No. 09/578095

U.S. DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office

NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

The drawing(s) filed (insert date) 5/25/00 are:

- A. Q approved by the Draftsperson under 37 CFR 1.84 or 1.152.
B. Q objected to by the Draftsperson under 37 CFR 1.84 or 1.152 for the reasons indicated below. Corrected drawings are required.

1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings: Black ink or Color (3 sets required).

- Color drawings are not acceptable until petition is granted. Fig(s) _____
Pencil and non black ink not permitted. Fig(s) _____

2. PHOTOGRAPHS. 37 CFR 1.84(h)

- One (1) full-tone set is required. Fig(s) _____
Photographs may not be mounted. 37 CFR 1.84(e)
Photographs must meet paper size requirements of 37 CFR 1.84(f). Fig(s) _____
Poor quality (half-tone). Fig(s) _____

3. TYPE OF PAPER. 37 CFR 1.84(e)

- Paper not flexible, strong, white, and durable. Fig(s) _____
Erasures, alterations, overwritings, interlineations, folds, copy machine marks not accepted. Fig(s) _____

4. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes.

- 21.0 cm by 29.7 cm (DIN size A4) or
21.6 cm by 27.9 cm (8 1/2 x 11 inches)
All drawing sheets not the same size. Sheet(s) _____
Drawing sheets not an acceptable size. Fig(s) _____

5. MARGINS. 37 CFR 1.84(g): Acceptable margins.

- Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm
Margins not acceptable. Fig(s) 1-5, 7, 8
Top (T) X Left (L) X
Right (R) X Bottom (B) X

6. VIEWS. 37 CFR 1.84(h)

REMARK: Specification may require revision to correspond to drawing changes, e.g., if Fig. 1 is changed to Fig. 1A, Fig. 1B and Fig. 1C, etc., the specification, at the Brief Description of the Drawings, must likewise be changed.

Views not labeled separately or properly. Fig(s) _____

7. SECTIONAL VIEWS. 37 CFR 1.84(b)(3)

Sectional designation should be noted with Arabic or Roman numbers. Fig(s) _____

8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i)

Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s) _____

9. SCALE. 37 CFR 1.84(k)

Scale not large enough to show mechanism without crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s) _____

10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(l)

Lines, numbers & letters not uniformly thick and well defined, clean, durable, and black (poor line quality). Fig(s) _____

11. SHADING. 37 CFR 1.84(m)

Solid black areas pale. Fig(s) _____
Solid black shading not permitted. Fig(s) _____

12. NUMBERS, LETTERS, & REFERENCE CHARACTERS. 37 CFR 1.84(p)

Numbers and reference characters not plain and legible. Fig(s) _____
Figure legends are poor. Fig(s) _____
Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(1) Fig(s) _____
English alphabet not used. 37 CFR 1.84(p)(2) Fig(s) _____

Numbers, letters and reference characters must be at least 32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3). Fig(s) _____

13. LEAD LINES. 37 CFR 1.84(q)

Lead lines missing. Fig(s) _____

14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.84(r)

Sheets not numbered consecutively, and in Arabic numerals beginning with number 1. Sheet(s) _____

15. NUMBERING OF VIEWS. 37 CFR 1.84(u)

Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) _____

16. DESIGN DRAWINGS. 37 CFR 1.152

Surface shading shown not appropriate. Fig(s) _____
Solid black surface shading is not permitted except when used to represent the color black as well as color contrast. Fig(s) _____

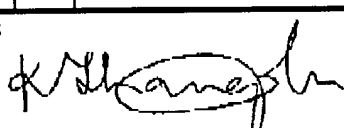
COMMENTS:

Reviewer AD

If you have questions, call (703) 305-8404.

Date 9/22/03

Attachment to Paper No. 3

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. RD-27,376	SERIAL NO.
INFORMATION DISCLOSURE STATEMENT BY APPLICANT— <u>LIST OF ITEMS</u> (Use several sheets if necessary)		APPLICANT JAMES K. ARAGONES, ET AL	
		Filing Date	Group
OTHER INFORMATION (Including Author, Title, Date, Page(s), Fig.)			
KAN	AU	R. GATLAND, ET AL " SOLVING ENGINE MAINTENANCE CAPACITY PROBLEMS WITH SIMULATION", PROCEEDINGS OF THE 1997 WINTER SIMULATION CONFERENCE, PP. 892-899.	
KAN	AV	AEROSPACE ENGINEERING/DECEMBER 1997, " CHANGES IN ENGINE MAINTENANCE MANAGEMENT", PP. 7-9.	
KAN	AW	AIRCRAFT TECHNOLOGY ENGINEERING & MAINTENANCE ENGINE YEARBOOK 1996 1997, " FORECASTING ENGINE REMOVALS AND SHOP VISITS", PP 74-77.	
KAN	AX	M. KAMINSKY, ET AL, " A MONTE CARLO APPROACH TO WARRANTY REPAIR PREDICTIONS", RELIABILITY, MAINTAINABILITY, SUPPORTABILITY & LOGISTICS, DALLAS, TX, 1997, PP. 1-5.	
	AY		
	AZ		
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	BZ		
EXAMINER 		DATE CONSIDERED 9/16/03	
<small>*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 608; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</small>			

Notice of References Cited	Application/Control No. 00/678,005	Applicant(s)/Patent Under Reexamination ARAGONES ET AL.	
	Examiner Kandasamy Thangavelu	Art Unit 2123	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,195,624	02-2001	Woodman et al.	703/7.
	B	US-5,701,471	12-1997	Subramanyam	707/200
	C	US-6,405,180	06-2002	Djaja et al.	703/25
	D	US-2001/0020228	09-2001	Lash	705/3
	E	US-6,740,233	04-1998	cave et al.	379/112.08
	F	US-6,132,980	10-2000	Stoughton et al.	435/6
	G	US-5,748,508	05-1998	Baleanu	703/13
	H	US-5,886,359	11-1997	Meester et al.	438/664
	I	US-2002/0035570	05-2002	Kozam et al.	707/104.1
	J	US 6,230,096	05-2001	Wang	/01/10
	K	US-5,822,218	10-1998	Moosa et al.	716/4
	L	US-8,370,454	04-2002	Moore	/01/29
	M	US-6,490,508	12-2002	March	700/286

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A		Document Number Country Code-Number-Kind Code	Date MM YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Endrenyl et al., "Probabilistic evaluation of the effect of maintenance on reliability - an Application", IEEE 1997
	V	Buller, "An expert system based framework for an incipient failure detection and predictive maintenance system", IEEE 1998
	W	Okogbua et al., "Time series intervention analysis for Preventive/ Predictive maintenance management of multiunit systems", IEEE 1998
	X	

* A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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Notice of References Cited

Part of Paper No. 3

Notice of References Cited	Application/Control No. 09/578,095	Applicant(s)/Patent Under Reexamination ARAGONES ET AL.	
	Examiner Kandasamy Thangavelu	Art Unit 2123	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,377,876	04-2002	Hedeen et al.	701/19
	B	US-6,408,258	06-2002	Richer	702/182
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

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	P					
	Q					
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	S					
	T					

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31 PAGES



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Due-6-4-04

Final

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/578,093	05/25/2000	James Kenneth Aragonen	RD-27,376	6313
6147 2500 01/04/2004 GENERAL ELECTRIC COMPANY GLOBAL RESEARCH PATENT DOCKET RM. BLDG. K1-4A59 SCHENECTADY, NY 12301-0008				
			EXAMINER	
			THANGAVELU, KANDASAMY	
			ART UNIT	PAPER NUMBER
			3123	6

MAR 8

DATE MAILED: 03/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (REV. 10/03)

EXHIBIT C

PAGE 37/92 * RCVD AT 5/17/2004 1:03:40 PM [Eastern Daylight Time] * SVR:USPTO-EFXXRF-1/1 * DNIS:8729306 * CSID:5183877751 * DURATION (mm-ss):20-40

Office Action Summary	Application No. 09/570,095		Applicant(s) ARAGONES ET AL	
	Examiner Kandasamy Thangavelu		Art Unit 2123	
	<p align="center">— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —</p> <p>Period for Reply</p> <p>A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.</p> <p>Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.</p> <p>If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.</p> <p>If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.</p> <p>Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).</p> <p>Status</p> <p>1) <input checked="" type="checkbox"/> Responsive to communication(s) filed on <u>18 December 2003</u>.</p> <p>2a) <input checked="" type="checkbox"/> This action is FINAL. 2b) <input type="checkbox"/> This action is non final.</p> <p>3) <input type="checkbox"/> Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under <i>Ex parte Quayle</i>, 1935 C.D. 11, 453 O.G. 213.</p> <p>Disposition of Claims</p> <p>4) <input checked="" type="checkbox"/> Claim(s) <u>1-6,9-16,20-26,29-35,40-46,49-56,60-66,69-76,80 and 81</u> is/are pending in the application.</p> <p>4a) Of the above claim(s) _____ is/are withdrawn from consideration.</p> <p>5) <input type="checkbox"/> Claim(s) _____ is/are allowed.</p> <p>6) <input checked="" type="checkbox"/> Claim(s) <u>1-6,9-16,20-26,29-36,40-46,49-56,60-66,69-76,80 and 81</u> is/are rejected.</p> <p>7) <input type="checkbox"/> Claim(s) _____ is/are objected to.</p> <p>8) <input type="checkbox"/> Claim(s) _____ are subject to restriction and/or election requirement.</p> <p>Application Papers</p> <p>9) <input type="checkbox"/> The specification is objected to by the Examiner.</p> <p>10) <input checked="" type="checkbox"/> The drawing(s) filed on <u>25 May 2000</u> is/are: a) <input type="checkbox"/> accepted or b) <input checked="" type="checkbox"/> objected to by the Examiner.</p> <p>Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).</p> <p>Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).</p> <p>11) <input type="checkbox"/> The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152</p> <p>Priority under 35 U.S.C. § 119</p> <p>12) <input type="checkbox"/> Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).</p> <p>a) <input type="checkbox"/> All b) <input type="checkbox"/> Some c) <input type="checkbox"/> None of:</p> <p>1. <input type="checkbox"/> Certified copies of the priority documents have been received.</p> <p>2. <input type="checkbox"/> Certified copies of the priority documents have been received in Application No. _____.</p> <p>3. <input type="checkbox"/> Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).</p> <p>* See the attached detailed Office action for a list of the certified copies not received.</p> <p>Attachment(s)</p> <p>1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-848)</p> <p>3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/GB/08) Paper No(s)/Mail Date _____</p> <p>4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date _____</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</p> <p>6) <input type="checkbox"/> Other: _____</p>			

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DETAILED ACTION

1. This communication is in response to the Applicants' Response mailed on December 18, 2003. Claims 1, 9, 20, 22, 29, 40, 42, 49, 60, 62, 69 and 80 were amended. Claims 7, 8, 17-19, 27, 28, 37-39, 47-48, 57-59, 67-68 and 77-79 were cancelled. Claims 1-6, 9-16, 20-26, 29-36, 40-46, 49-56, 60-66, 69-76 and 80-81 of the application are pending. This office action is made final.

Response to Arguments

2. Applicants' arguments filed on December 18, 2003 have been fully considered. The arguments with respect to Claims 1, 22, 42 and 62 are discussed beginning in Paragraph 17.1. The applicant's amendments necessitated the new grounds of rejection.

Information Disclosure Statement

3. Acknowledgment is made of the information disclosure statements filed on January 8, 2004 together with copies of the papers and patents. The papers and patents have been considered in reviewing the claims.

Drawings

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4. The drawings were objected to; see a copy of Form PTO-948 sent with paper No. 3 for an explanation. The Figures 2-5, 7 and 8 were objected to because of unacceptable top/left margins. Applicants are requested to send corrected drawings in response to this Office action.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-3, 5-6, 22, 23, 25-26, 42, 43, 45-46, 62, 63 and 65-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbles (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997), and further in

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view of Endrenyi et al. (EN) (IEEB, 1997), Butler (BU) ("An expert system based Framework for an incipient failure detection and Preventive maintenance system, IEEE 1996), and Wang (WA) (U.S. Patent 6,230,095) and Husseiny (HU) (U.S. Patent 5,210,704).

7.1 KA teaches a Monte Carlo approach to Warranty Repair predictions. Specifically, as per Claim 1, KA teaches a system for predicting the timing of a future service event of a product formed from a plurality of compartments (Pg 1, Abstract; Pg 2, CL2, Para 3 & 4).

KA does not expressly teach a database that contains a plurality of service information and a plurality of performance information for the product. CR teaches a database that contains a plurality of service information (Pg 9, CL1, Para 2 & 3) and a plurality of performance information for the product (Pg 9, CL1, Para 4), as the performance information indicates specific deterioration and the service information and the performance information will identify the likely maintenance actions required at the next shop visit (Pg 9, CL1, Para 3) so the maintenance shop can develop proper maintenance process (Pg 9, CL1, Para 4). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of CR that included a database that contained a plurality of service information and a plurality of performance information for the product, as the performance information would indicate specific deterioration and the service information and the performance information would identify the likely maintenance actions required at the next shop visit so the maintenance shop could develop proper maintenance process.

KA does not expressly teach a statistical analyzer that analyzes the plurality of service information to determine a plurality of compartment failure information. EN teaches a statistical

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analyzer that analyzes the plurality of service information to determine a plurality of compartment failure information (Pg 576, CL2, Para 2 & 5; Pg 578, CL1, Para 4 & 5; Fig. 2; Pg 579, CL2, Para 5; Fig. 6), as the compartment failure information can be used to determine means, variances and the probability distributions of times to failures of the compartments (Pg 578, CL1, Para 4 & 5). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of EN that included a statistical analyzer that analyzes the plurality of service information to determine a plurality of compartment failure information, as the compartment failure information could be used to determine means, variances and the probability distributions of times to failures of the compartments.

KA does not expressly teach that the plurality of compartment failure information comprises compartment failure variables and compartment time-to-failure coefficients. EN teaches that the plurality of compartment failure information comprises compartment failure variables and compartment time-to-failure coefficients (Pg 578, CL2, Para 3 to Pg 579, CL1, Para 3; Fig. 6), as the information can be used to obtain the failure information for the entire system and the cost incurred due to component failures (Pg 581, CL2, Para 2); and a mathematical model can be constructed linking failures and maintenance modes and used to compute costs of alternative maintenance schedules (Pg 581, CL2, Para 3). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of EN that included that the plurality of compartment failure information comprising compartment failure variables and compartment time-to-failure coefficients, as the information could be used to obtain the failure information for the entire

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system and the cost incurred due to component failures and a mathematical model could be constructed linking failures and maintenance modes and used to compute costs of alternative maintenance schedules.

KA does not expressly teach that the statistical analyzer uses the plurality of compartment failure information to determine which compartment failure variables influence the timing of future service events and estimate time-to-failure distributions for the plurality of compartments. EN teaches that the statistical analyzer uses the plurality of compartment failure information to determine which compartment failure variables influence the timing of future service events and estimate time to failure distributions for the plurality of compartments (Fig. 3; Pg 578, CL2, Para 3 to Pg 579, CL1, Para 3; Fig. 2; Fig. 6), as the information can be used to obtain the failure information for the entire system and the cost incurred due to component failures (Pg 581, CL2, Para 2); and a mathematical model can be constructed linking failures and maintenance modes and used to compute costs of alternative maintenance schedules (Pg 581, CL2, Para 3). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of EN that included the statistical analyzer using the plurality of compartment failure information to determine which compartment failure variables influence the timing of future service events and estimate time-to-failure distributions for the plurality of compartments, as the information could be used to obtain the failure information for the entire system and the cost incurred due to component failures and a mathematical model could be constructed linking failures and maintenance modes and used to compute costs of alternative maintenance schedules.

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KA does not expressly teach a performance deterioration rate analyzer that analyzes performance deterioration rate of the product from the plurality of service information and performance information. CR teaches a performance deterioration rate analyzer that analyzes performance deterioration rate of the product from the plurality of service information and performance information (Pg 9, CL1, Para 3 & 4), as the performance deterioration rate information identifies the likely maintenance actions required at the next shop visit (Pg 9, CL1, Para 3), so the maintenance shop could develop proper maintenance process (Page 9, CL1, Para 4). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of CR that included a performance deterioration rate analyzer that analyzes performance deterioration rate of the product from the plurality of service information and performance information, as the performance deterioration rate information would identify the likely maintenance actions required at the next shop visit so the maintenance shop could develop proper maintenance process.

KA, CR and EN do not expressly teach that the performance deterioration rate analyzer comprises a statistical analysis script that relates a subset of compartments of the product according to time. BU teaches that the performance deterioration rate analyzer comprises a statistical analysis script that relates a subset of compartments of the product according to time (Pg 321, CL1, Para 5; Pg 321, CL2, Para 2; Pg 322, CL1, Para 3; Pg 321, CL2, Para 4 & 5), as the determination of the related times to failures of the compartments facilitates optimizing preventive maintenance program through system wide approach to predict equipment failures (Pg. 321, CL2, Para 2 & 3). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR and EN with the system of BU

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that included the performance deterioration rate analyzer comprising a statistical analysis script that relates a subset of compartments of the product according to time, as the determination of the related times to failures of the compartments would facilitate optimizing preventive maintenance program through system wide approach to predict equipment failures.

KA, CR, EN and BU do not expressly teach that the statistical analysis script generates an estimated deterioration rate curve for the subset of compartments of the product. WA teaches that the statistical analysis script generates an estimated deterioration rate curve for the subset of compartments of the product (Abstract; CL2, L22-37), as the deterioration curve can be used to generate a warning signal to the system operator and as a tool for product service recommendations (CL1, Lines 15-18). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN and BU with the system of WA that included the statistical analysis script generating an estimated deterioration rate curve for the subset of compartments of the product, as the deterioration curve could be used to generate a warning signal to the system operator and as a tool for product service recommendations.

KA, CR, EN and WA do not expressly teach that the performance deterioration rate analyzer further comprises a transformer that transforms each estimated deterioration rate curve for a compartment to a performance life distribution. HU teaches that the performance deterioration rate analyzer further comprises a transformer that transforms each estimated deterioration rate curve for a compartment to a performance life distribution (CL1, L47-50; CL2, L7-32; CL4, L61-63), as stochastic models can be used to predict performance degradation (CL4, L61-63; CL4, L43-47) and significant increase in availability, reliability and maintainability can

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be achieved by developing a capacity to continuously predict the remaining acceptable operating life (CL2, L7-11). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN and WA with the system of IJU that included the performance deterioration rate analyzer further comprising a transformer that transformed each estimated deterioration rate curve for a compartment to a performance life distribution, as stochastic models could be used to predict performance and significant increase in availability, reliability and maintainability could be achieved by developing a capacity to continuously predict the remaining acceptable operating life.

KA teaches a simulator for simulating a distribution of future service events of the product according to the time-to-failure distributions (Pg 1, Abstract; Pg 1, CL1, Para 3; Pg 2, CL2, Para 3 & 4; Pg 3, CL2, Para 2; Fig. 5). KA does not expressly teach a simulator for simulating a distribution of future service events of the product according to the performance life distributions. HU teaches a simulator for simulating a distribution of future service events of the product according to the performance life distributions (CL2, L7-32; CL5, L53-57; CL13, L8-46), as such simulation can be used to alert personnel of the expected duration of the acceptable operating time (CL6, L65-66) and significant increase in availability, reliability and maintainability can be achieved by developing a capacity to continuously predict the remaining acceptable operating life (CL2, L7-11). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of HU that included a simulator for simulating a distribution of future service events of the product according to the performance life distributions, as such simulation could be used to alert personnel of the expected duration of the acceptable operating time and significant increase in

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availability, reliability and maintainability could be achieved by developing a capacity to continuously predict the remaining acceptable operating life.

Dependent claims

Per Claim 2: KA, CR, EN, BU, WA and HU teach the system of Claim 1. KA does not expressly teach that the database comprises a service database and a performance historical database. CR teaches that the database comprises a service database and a performance historical database (Pg 9, CL1, Para 2 & 3), as the performance information indicates specific deterioration and the service information and the performance information will identify the likely maintenance actions required at the next shop visit (Pg 9, CL1, Para 3) so the maintenance shop can develop proper maintenance process (Pg 9, CL1, Para 4). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of CR that included the database comprising a service database and a performance historical database, as the performance information would indicate specific deterioration and the service information and the performance information would identify the likely maintenance actions required at the next shop visit so the maintenance shop could develop proper maintenance process.

Per Claim 3: KA, CR, EN, BU, WA and HU teach the system of Claim 1. KA does not expressly teach that the plurality of service information comprises compartment definitions, repair history and service factors. CR teaches that the plurality of service information comprises compartment definitions, repair history and service factors (Pg 9, CL1, Para 2 & 3), as the

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service information will identify the likely maintenance actions required at the next shop visit, so suitable preparations can be made before the product arrives for repair and maintenance (Pg 9, Cl.1, Para 3). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of CR that included the plurality of service information comprising compartment definitions, repair history and service factors, as the service information would identify the likely maintenance actions required at the next shop visit, so suitable preparations could be made before the product arrives for repair and maintenance.

Per Claim 5: KA, CR, EN, BU, WA and HU teach the system of Claim 1. KA does not expressly teach system further comprising a preprocessor for processing the plurality of service information into a predetermined format. EN teaches system further comprising a preprocessor for processing the plurality of service information into a predetermined format (Fig. 3), as the service information can be used to obtain the compartment failure information (Fig. 2) and compartment failure information can be used to determine means, variances and the probability distributions of times to failures of the compartments (Pg 578, Cl.1, Para 4 & 5). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of EN that included system further comprising a preprocessor for processing the plurality of service information into a predetermined format, as the service information could be used to obtain the compartment failure information and the compartment failure information could be used to determine means, variances and the probability distributions of times to failures of the compartments.

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Per Claim 6: KA, CR, EN, BU, WA and HU teach the system of Claim 1. KA does not expressly teach that the preprocessor generates a plurality of data files according to the plurality of service information. EN teaches that the preprocessor generates a plurality of data files according to the plurality of service information (Fig. 2), as the information can be used to predict the mean and distribution of the remaining life to failure for any stage of aging (Pg 576, Abstract). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of EN that included the preprocessor generating a plurality of data files according to the plurality of service information, as the information could be used to predict the mean and distribution of the remaining life to failure for any stage of aging.

7.2 As per Claims 22, 23, 25-26, 42, 43, 45-46, 62, 63 and 65-66, these are rejected based on the same reasoning as Claims 1, 3, and 5-6, supra. Claims 22, 23, 25-26, 42, 43, 45-46, 62, 63 and 65-66 are system, method and computer readable medium claims reciting the same limitations as Claims 1, 3, and 5-6, as taught throughout by KA, CR, EN, BU, WA and HU.

8. Claims 4, 21, 24, 41, 44, 61, 64 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminsky et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997) and Endrenyi et al. (EN) (IEEE, 1997) and further in view of Butler (BU) ("An expert system based framework for an

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incipient failure detection and Preventive maintenance system, IEEE 1996), and Wang (WA) (U.S. Patent 6,230,095) and Hussciny (HU) (U.S. Patent 5,210,704) and Aerospace Technology (AT) ("Forecasting engine removals and shop visits", Aircraft Technology Engineering & maintenance, 1996-1997).

8.1 As per Claim 4, KA, CR, EN, BU, WA and HU teach the system of Claim 1. KA, CR, EN, BU, WA and HU do not expressly teach that the plurality of performance information comprises performance characteristic values, initial data levels after servicing, current data levels. AT teaches that the plurality of performance information comprises performance characteristic values, initial data levels after servicing, current data levels (Pg 3, CL1, Para 1 & 3; Pg 4, CL1, Para 2; Pg. 4, CL2, Para 1), as the information can be used to forecast product removal rates to construct a plan for incoming product volumes; and the forecast can be used for maintenance cost planning yielding requirements for material and manpower for maintenance (Pg 3, CL1, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN, BU, WA and HU with the system of AT that included the plurality of performance information comprising performance characteristic values, initial data levels after servicing, current data levels, as the information could be used to forecast product removal rates to construct a plan for incoming product volumes; and the forecast could be used for maintenance cost planning yielding requirements for material and manpower for maintenance.

KA, EN, BU, WA, HU and AT do not expressly teach that the plurality of performance information comprises dates at which the product is serviced, and variables that affect the

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servicing of a subset of the plurality of compartments. CR teaches that the plurality of performance information comprises dates at which the product is serviced, and variables that affect the servicing of a subset of the plurality of compartments (Pg 9, CL1, Para 3 to 6), as the performance information will identify the likely maintenance actions required at the next shop visit (Pg 9, CL1, Para 3) so the maintenance shop can develop proper maintenance process (Pg 9, CL1, Para 4). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, EN, BU, WA, HU and AT with the system of CR that included the plurality of performance information comprising dates at which the product would be serviced, and variables that affect the servicing of a subset of the plurality of compartments, as the performance information would identify the likely maintenance actions required at the next shop visit so the maintenance shop could develop proper maintenance process.

Per Claim 21: KA, CR, EN, BU, WA and HU teach the system of Claim 1. KA does not expressly teach that the simulator forecasts a service plan for the future service events that comprises the time for scheduling the service events. AT teaches that the simulator forecasts a service plan for the future service events that comprises the time for scheduling the service events (Pg 3, CL1, Para 2; Pg 4, CL1, Para 2; Pg 4, CL2, Para 1), as the forecast can be used for maintenance cost planning yielding requirements for material and manpower for maintenance (Pg 3, CL1, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA with the system of AT that included that the simulator forecast a service plan for the future service events that comprised the time for

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scheduling the service events, as the forecast could be used for maintenance cost planning yielding requirements for material and manpower for maintenance.

8.2 As per Claims 24, 41, 44, 61, 64 and 81, these are rejected based on the same reasoning as Claims 4 and 21, supra. Claims 24, 41, 44, 61, 64 and 81 are system, method and computer readable medium claims reciting the same limitations as Claims 4 and 21, as taught throughout by KA, CR, EN, BU, WA, HU and AT.

9. Claims 9, 29, 49 and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997) and Endrenyi et al. (EN) (IEEE, 1997) and further in view of Butler (BU) ("An expert system based Framework for an incipient failure detection and Preventive maintenance system, IEEE 1996), Wang (WA) (U.S. Patent 6,230,095), Hussein (HU) (U.S. Patent 5,210,704) and Woodman et al. (WO) (U.S. Patent 6,195,624).

9.1 As per Claim 9, KA, CR, EN, BU, WA and HU teach the system of Claim 1. KA, CR, EN, BU, WA and HU do not expressly teach that the statistical analyzer uses the estimated time-to-failure distributions to determine a Weibull distribution for a subset of the plurality of compartments defined for the product. WO teaches that the statistical analyzer uses the estimated time-to-failure distributions to determine a Weibull distribution for a subset of the plurality of compartments defined for the product (CL6, L30-56), as the Weibull model uses

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shape and scale parameters which have physical significance; the scale parameter indicates the time at which 63% of the population have failed; and the shape parameter indicates the rate at which the failures increase (CL6, L48-56). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN, BU, WA and HU with the system of WO that included the statistical analyzer using the estimated time-to-failure distributions to determine a Weibull distribution for a subset of the plurality of compartments defined for the product, as the Weibull model uses shape and scale parameters which have physical significance; the scale parameter indicates the time at which 63% of the population have failed; and the shape parameter indicates the rate at which the failures increase.

9.2 As per Claims 29, 49 and 69, these are rejected based on the same reasoning as Claim 9, supra. Claims 29, 49 and 69 are system, method and computer readable medium claims reciting the same limitations as Claim 9, as taught throughout by KA, CR, EN, BU, WA, HU and WO.

10. Claims 10, 30, 50 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997) and Eudrenyi et al. (EN) (IEEE, 1997) and further in view of Butler (BU) ("An expert system based Framework for an incipient failure detection and Preventive maintenance system, IEEE 1996), Wang (WA) (U.S. Patent 6,230,095), Hussein (HU) (U.S. Patent 5,210,704) and Subramanyam (SU) (U.S. Patent 5,701,471).

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10.1 As per Claim 10, KA, CR, EN, BU, WA and HU teach the system of Claim 1. KA, CR, EN, BU, WA and HU do not expressly teach that the statistical analyzer comprises a service analysis script that executes a plurality of statistical procedures. SU teaches that the statistical analyzer comprises a service analysis script that executes a plurality of statistical procedures (Abstract; Fig. 1, BLK 116 and 120; Fig. 2; CL2, L25-43), as the scripts specify the operations to be performed and the performance statistics to be collected (CL2, L25-29). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN, BU, WA and HU with the system of SU that included the statistical analyzer comprising a service analysis script that executed a plurality of statistical procedures, as the scripts would specify the operations to be performed and the performance statistics to be collected.

10.2 As per Claims 30, 50 and 70, these are rejected based on the same reasoning as Claim 10, supra. Claims 30, 50 and 70 are system, method and computer readable medium claims reciting the same limitations as Claim 10, as taught throughout by KA, CR, EN, BU, WA, HU and SU.

11. Claims 11, 31, 51 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997) and Endrenyi et al. (EN) (IEEE, 1997) and further in view of Butler (BU) ("An expert system based Framework for an incipient failure detection and Preventive maintenance system, IEEE 1996), Wang (WA) (U.S. Patent 6,230,095), Hussein

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(HU) (U.S. Patent 5,210,704), Subramanyam (SU) (U.S. Patent 5,701,471) and Djaja et al.

(DJ) (U.S. Patent 6,405,160).

11.1 As per Claim 11, KA, CR, EN, BU, WA, HU and SU teach the system of Claim 10. KA, CR, EN, BU, WA, HU and SU do not expressly teach that the plurality of statistical procedures comprise a multivariate regression and/or a correlation analysis. DJ teaches that the plurality of statistical procedures comprise a multivariate regression and/or a correlation analysis (CL5, L52-59), as in the multivariate regression analysis, the changes in independent variables that correlate highly with dependent variables are allowed to remain in the modeling equation (CL2, L25-29). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN, BU, WA, HU and SU with the system of DJ that included the plurality of statistical procedures comprising a multivariate regression and/or a correlation analysis, as in the multivariate regression analysis, the changes in independent variables that correlate highly with dependent variables would be allowed to remain in the modeling equation.

11.2 As per Claims 31, 51 and 71, these are rejected based on the same reasoning as Claim 11, supra. Claims 31, 51 and 71 are system, method and computer readable medium claims reciting the same limitations as Claim 11, as taught throughout by KA, CR, EN, BU, WA, HU, SU and DJ.

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12. Claims 12, 32, 52 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997) and Endrenyi et al. (EN) (IEEE, 1997) and further in view of Butler (BU) ("An expert system based Framework for an incipient failure detection and Preventive maintenance system, IEEE 1996), Wang (WA) (U.S. Patent 6,230,095), Hussainy (HU) (U.S. Patent 5,210,704), Subramanyam (SU) (U.S. Patent 5,701,471) and Cave et al. (CA) (U.S. Patent 5,740,233).

12.1 As per Claim 12, KA, CR, EN, BU, WA, HU and SU teach the system of Claim 10. KA, CR, EN, BU, WA, HU and SU do not expressly teach that the service analysis script generates a plurality of statistical diagnostic information. CA teaches that the service analysis script generates a plurality of statistical diagnostic information (CL3, L27-30; CL3, L55-64), as changes in the statistical diagnostic information could be used to identify faults and alert the personnel, when they fall outside set thresholds (CL4, L9-15). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN, BU, WA, HU and SU with the system of CA that included the service analysis script generating a plurality of statistical diagnostic information, as changes in the statistical diagnostic information could be used to identify faults and alert the personnel, when they fell outside set thresholds.

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12.2 As per Claims 32, 52 and 72, these are rejected based on the same reasoning as Claim 12, supra. Claims 32, 52 and 72 are system, method and computer readable medium claims reciting the same limitations as Claim 12, as taught throughout by KA, CR, EN, BU, WA, HU, SU and CA.

13. Claims 13, 33, 53 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Crabbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997) and Endreyi et al. (EN) (IEEE, 1997) and further in view of Butler (BU) ("An expert system based Framework for an incipient failure detection and Preventive maintenance system, IEEE 1996), Wang (WA) (U.S. Patent 6,230,095), Hussein (HU) (U.S. Patent 5,210,704), Subramanyam (SU) (U.S. Patent 5,701,471), Cave et al. (CA) (U.S. Patent 5,740,233), Stoughton et al. (ST) (U.S. Patent 6,132,969) and Baleanu (BA) (U.S. Patent 5,748,508).

12.1 As per Claim 13, KA, CR, EN, BU, WA, HU, SU and CA teach the system of Claim 12. KA, CR, EN, BU, WA, HU, SU and CA do not expressly teach that the plurality of statistical diagnostic information comprises goodness-of-fit metrics and collinearity diagnostics. ST teaches that the plurality of statistical diagnostic information comprises goodness-of-fit metrics (Abstract; CL3, L26-52; CL3, L55-64), as goodness-of-fit measures how well a given model represents the underlying data (CL3, L26-28). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN, BU,

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WA, HU, SU and CA with the system of ST that included the plurality of statistical diagnostic information comprising goodness-of-fit metrics, as goodness-of-fit would measure how well a given model represents the underlying data.

KA, CR, EN, BU, WA, HU, SU, CA and ST do not expressly teach that the plurality of statistical diagnostic information comprises collinearity diagnostics. BA teaches that the plurality of statistical diagnostic information comprises collinearity diagnostics (Abstract), as collinearity measures is used to identify collinearity free regression models to best model and control a process (Abstract). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN, BU, WA, HU, SU, CA and ST with the system of BA that included the plurality of statistical diagnostic information comprising collinearity diagnostics, as collinearity measures would be used to identify collinearity free regression models to best model and control a process.

13.2 As per Claims 33, 53 and 73, these are rejected based on the same reasoning as Claim 13, supra. Claims 33, 53 and 73 are system, method and computer readable medium claims reciting the same limitations as Claim 13, as taught throughout by KA, CR, EN, BU, WA, HU, SU, CA, ST and BA.

14. Claims 14, 34, 54 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997), and Endrenyi et al. (EN) (IEEE, 1997) and further in

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view of **Butler (BU)** ("An expert system based Framework for an incipient failure detection and Preventive maintenance system, IEEE 1996), **Wang (WA)** (U.S. Patent 6,230,095), **Husseiny (HU)** (U.S. Patent 5,210,704), **Subramanyam (SU)** (U.S. Patent 5,701,471) and **Meester et al. (ME)** (U.S. Patent 5,686,359).

14.1 As per Claim 14, **KA, CR, EN, BU, WA, HU** and **SU** teach the system of Claim 10. **KA, CR, EN, BU, WA, HU** and **SU** do not expressly teach that the service analysis script generates a plurality of residual plots. **ME** teaches that the service analysis script generates a plurality of residual plots (CL4, L52-56), as the residual plots indicate the lack of inadequacy of the models (CL3, L26-28). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of **KA, CR, EN, BU, WA, HU** and **SU** with the system of **ME** that included the service analysis script generating a plurality of residual plots, as the residual plots would indicate the lack of inadequacy of the models.

14.2 As per Claims 34, 54 and 74, these are rejected based on the same reasoning as Claim 14, supra. Claims 34, 54 and 74 are system, method and computer readable medium claims reciting the same limitations as Claim 14, as taught throughout by **KA, CR, EN, BU, WA, HU, SU** and **ME**.

15. Claims 15, 16, 35, 36, 55, 56, 75 and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kaminsky et al. (KA)** ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of **Cribbes (CR)** ("Changes in Engine

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maintenance management", Aerospace Engineering, December 1997) and Endrenyi et al. (EN) (IEEE, 1997) and further in view of Butler (BU) ("An expert system based Framework for an incipient failure detection and Preventive maintenance system, IEEE 1996), Wang (WA) (U.S. Patent 6,230,095), Hussein (HU) (U.S. Patent 5,210,704) and Kozam et al. (KO) (U.S. Patent application 2002/0035570).

15.1 As per Claim 15, KA, CR, EN, BU, WA and HU teach the system of Claim 1. KA, CR, EN, BU, WA and HU do not expressly teach that the statistical analyzer comprises a validation script. KO teaches that the statistical analyzer comprises a validation script (Para 0008, Para 0029), as the validation script provides information necessary to check the data received as service and performance information against the data already in the database (Para 0033). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN, BU, WA and HU with the system of KO that included the statistical analyzer comprising a validation script, as the validation script would provide information necessary to check the data received as service and performance information against the data already in the database.

Per Claim 16: KA, CR, EN, BU, WA and HU do not expressly teach that the validation script is applied to a plurality of case studies set up for the product. KO teaches that the validation script is applied to a plurality of case studies set up for the product (Para 0008, Para 0029), as the validation script provides information necessary to check the data received as service and performance information against the data already in the database (Para 0033). It

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would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of KA, CR, EN, BU, WA and HU with the system of KO that included the validation script being applied to a plurality of case studies set up for the product, as the validation script would provide information necessary to check the data received as service and performance information against the data already in the database.

15.2 As per Claims 35, 36, 55, 56, 75 and 76, these are rejected based on the same reasoning as Claims 15 and 16, *supra*. Claims 35, 36, 55, 56, 75 and 76 are system, method and computer readable medium claims reciting the same limitations as Claims 15 and 16, as taught throughout by KA, CR, EN, BU, WA, HU and KO.

16. Claims 20, 40, 60 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminskiy et al. (KA) ("A Monte Carlo approach to Warranty Repair predictions", SAE International, 1997) in view of Cribbes (CR) ("Changes in Engine maintenance management", Aerospace Engineering, December 1997) and Endrenyi et al. (EN) (IEEE, 1997) and further in view of Butler (BU) ("An expert system based Framework for an incipient failure detection and Preventive maintenance system, IEEE 1996), Wang (WA) (U.S. Patent 6,230,095), Hussein (HU) (U.S. Patent 5,210,704) and Moosa et al. (MO) (U.S. Patent 5,822,218).

16.1 As per Claim 20, KA, CR, EN, BU, WA and HU teach the system of Claim 1. KA, CR, EN, BU, WA and HU do not expressly teach that the simulator uses the performance life distributions to determine a Weibull distribution for a subset of the plurality of compartments

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defined for the product. **MO** teaches that the simulator uses the performance life distributions to determine a Weibull distribution for a subset of the plurality of compartments defined for the product (CL4, L56-67), as the Weibull distribution is sensitive to the distribution shape parameter at the extremities of the distribution and extrapolations can be made based on the properties of the distribution (CL4, L56-67; CL17, L36-41). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the system of **KA**, **CR**, **EN**, **BU**, **WA** and **HU** with the system of **MO** that included the simulator using the performance life distributions to determine a Weibull distribution for a subset of the plurality of compartments defined for the product, as the Weibull distribution is sensitive to the distribution shape parameter at the extremities of the distribution and extrapolations could be made based on the properties of the distribution.

16.2 As per Claims 40, 60 and 80, these are rejected based on the same reasoning as Claim 20, supra. Claims 40, 60 and 80 are system, method and computer readable medium claims reciting the same limitations as Claim 20, as taught throughout by **KA**, **CR**, **EN**, **BU**, **WA**, **HU** and **MO**.

Arguments

17.1 As per the applicants' argument that "KA in view of CR and EN does not disclose or suggest performing a simulation based on time-to-failure distributions and performance life distributions; the simulations performed by KA, CR and EN is based on time-to-failure distributions", the examiner has used a new reference (**HU**). KA and HU teach simulation based

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on time-to-failure distributions and performance life distributions. KA teaches a simulator for simulating a distribution of future service events of the product according to the time-to-failure distributions (Pg 1, Abstract; Pg 1, CL1, Para 3; Pg 2, CL2, Para 3 & 4; Pg 3, CL2, Para 2; Fig. 5). HU teaches a simulator for simulating a distribution of future service events of the product according to the performance life distributions (CL2, L7-32; CL5, L53-57; CL13, L8-46).

17.2 As per the applicants' argument that "KA, CR, EN, BU and WA do not disclose or suggest estimating the deterioration rate curves for a subset of compartments in a product and transforming the deterioration rate curves to a performance life distribution", the examiner has used a new reference (HU). WA teaches that the statistical analysis script generates an estimated deterioration rate curve for the subset of compartments of the product (Abstract; CL2, L22-37). HU teaches that the performance deterioration rate analyzer further comprises a transformer that transforms each estimated deterioration rate curve for a compartment to a performance life distribution (CL1, L47-50; CL2, L7-32; CL4, L61-63).

Conclusion

ACTION IS FINAL – NECESSITATED BY AMENDMENT

18. Applicant's amendments necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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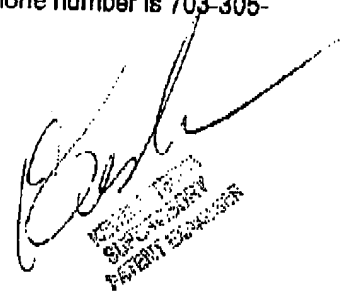
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 703-305-0043. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska, can be reached on (703) 305-9704. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9600.

K. Thangavelu
Art Unit 2123
February 26, 2004



JAN 12 2004
PATENT & TRADEMARK OFFICE

Sheet 1 of 1

FORM PTO-1449 (REV. 7-80)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. RD-27,376-4		SERIAL NO. 09/578,093	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT <u>LIST OF ITEMS</u>				Applicant JAMES K. ARAGONES, ET AL			
				Filing Date 5/25/00		Group 2123	
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE	
K/AN	AA 5,608,845	3/4/97	OHTSUKA, ET AL	704	185	RECEIVED JAN 14 2004 Technology Center 2100	
K/AN	AB 6,381,556	4/30/02	KAZEMI, ET AL	702	185		
K/AN	AC 6,532,427	3/11/03	JOSHI, ET AL	702	185		
AD							
AP							
FOREIGN PATENT DOCUMENTS							
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO	
	R1						
	R2						
	B3						
OTHER INFORMATION (Including Author, Title, Date, Pertinent Pages, etc.)							
K/AN	C1	YONG IIWAN KIM, "A FORECASTING METHODOLOGY FOR MAINTENANCE COST OF LONG-LIFE EQUIPMENT", A DISSERTATION, TUSCALOOSA, AL., 1989, PG 1 - 221.					
K/AN	C2	STEVE VESTAL, "ON THE ACCURACY OF PREDICTING RATE MONOTONIC SCHEDULING PERFORMANCE", 1990 ACM 0-897-409-0/90/1200, PP. 244-253.					
K/AN	C3	ROBB NEWMAN, "PERFORMANCE ANALYSIS CASE STUDY: APPLICATION OF EXPERIMENTAL DESIGN & STATISTICAL DATA ANALYSIS TECHNIQUES", 1991 ACM 089791-392-2/91/005/0211, PP. 214-215.					
EXAMINER <i>K/AN (signature)</i>				DATE CONSIDERED 2/24/04			
EXAMINER. Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant							

FORM PTO-1449 (REV. 7-80)		JAN 17 2004 RECEIVED		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. RD-27,376-4		SERIAL NO. 09/578,093	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT <u>LIST OF ITEMS</u>						Applicant JAMES K. ARAGONES, ET AL			
						Filing Date 5/25/00		Group 2123	
U.S. PATENT DOCUMENTS									
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE			
R/S	AA 5,455,777	10/3/95	FUJYAMA, ET AL	700	34				
R/S	AB 6,067,486	3/23/00	ARAGONES, ET AL	701	29				
	AC								
	AD								
	AE								
FOREIGN PATENT DOCUMENTS									
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO			
R/S	B1 WO 98/24042	6/4/98	PCT						
	R2 EP0867841 A2	9/30/98	EPO						
R/S	R3 JP2000097814	7/4/00	Patent Abstracts of Japan						
OTHER INFORMATION (Including Author, Title, Date, Pertinent Pages, etc.)									
	C1	<div style="text-align: right;"> RECEIVED JAN 14 2004 Technology Center 2100 </div>							
	C2								
	C3								
EXAMINER K. H. [Signature]				DATE CONSIDERED 2/24/04					
EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant									

Notice of References Cited	Application/Control No. 09/578,095	Applicant(s)/Patent Under Reexamination James Aragones	
	Examiner Kandasamy Thangavelu	Art Unit 2123	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,210,704	05-1993	Husseiny	702/34
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Page(s)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a))
 Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

U.S. Patent and Trademark Office
 PTO-802 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 8